

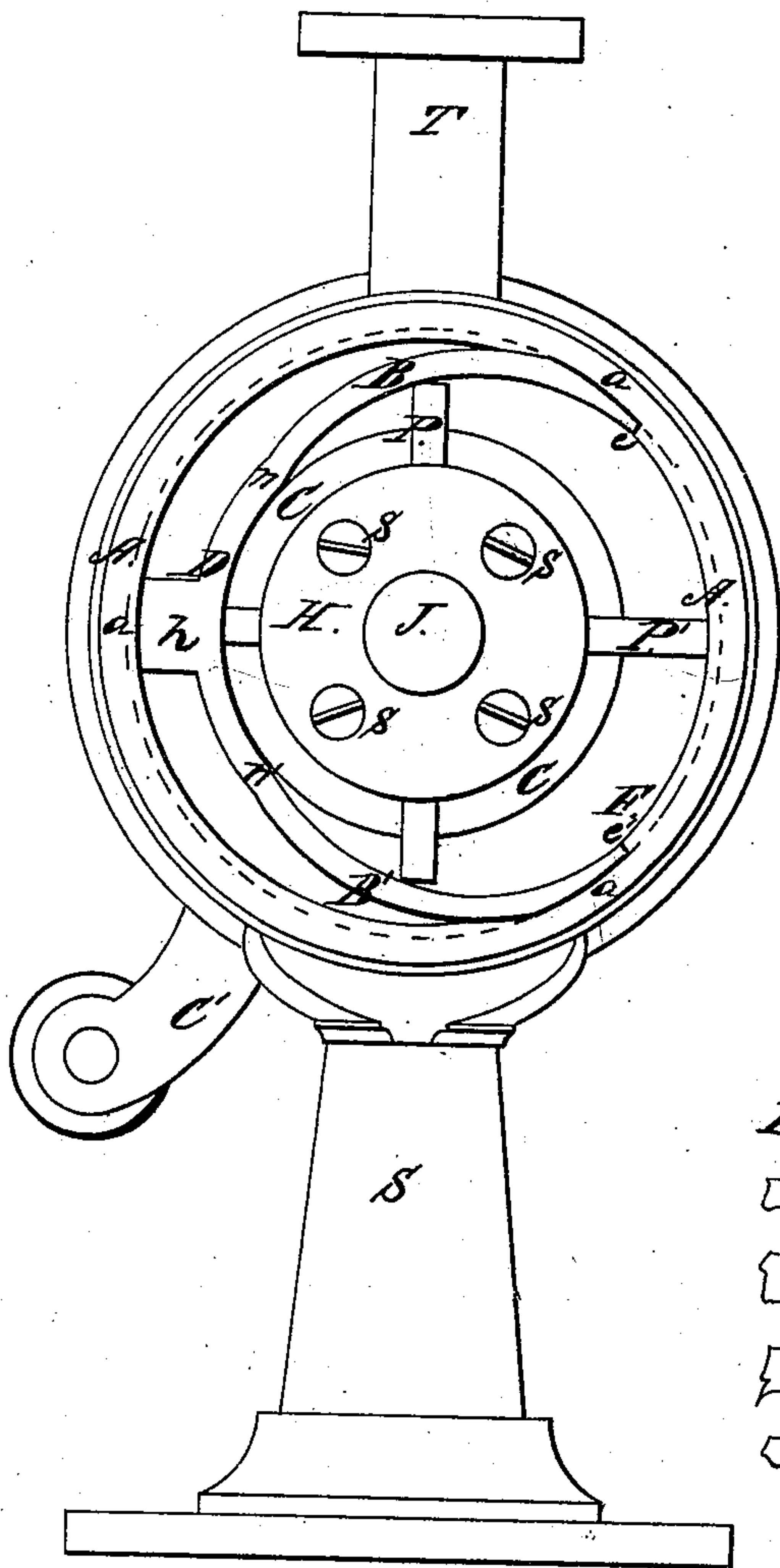
*R Gilbert,*

*Rotary Pump.*

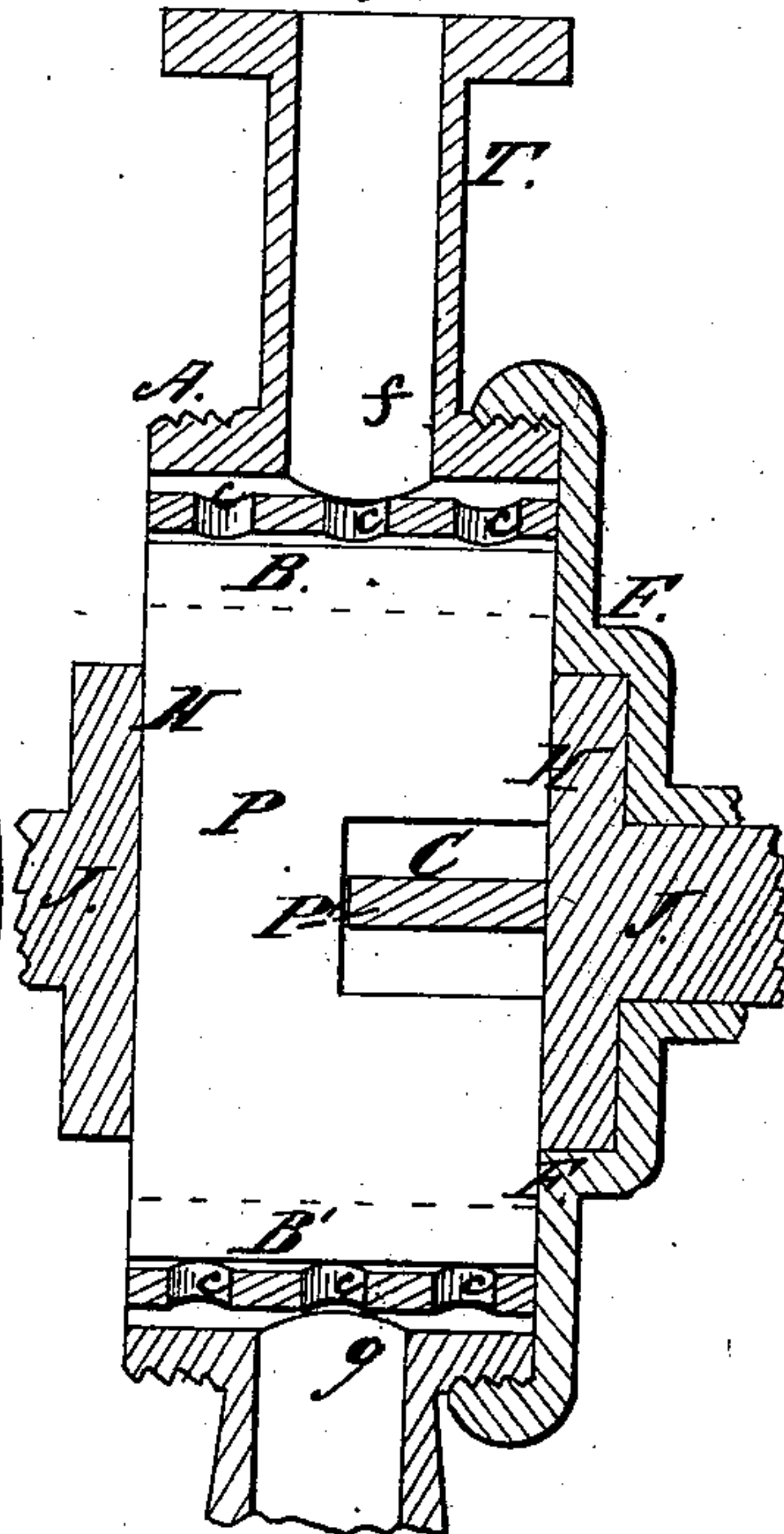
*N<sup>o</sup> 42,083.*

*Patented Mar. 29, 1864.*

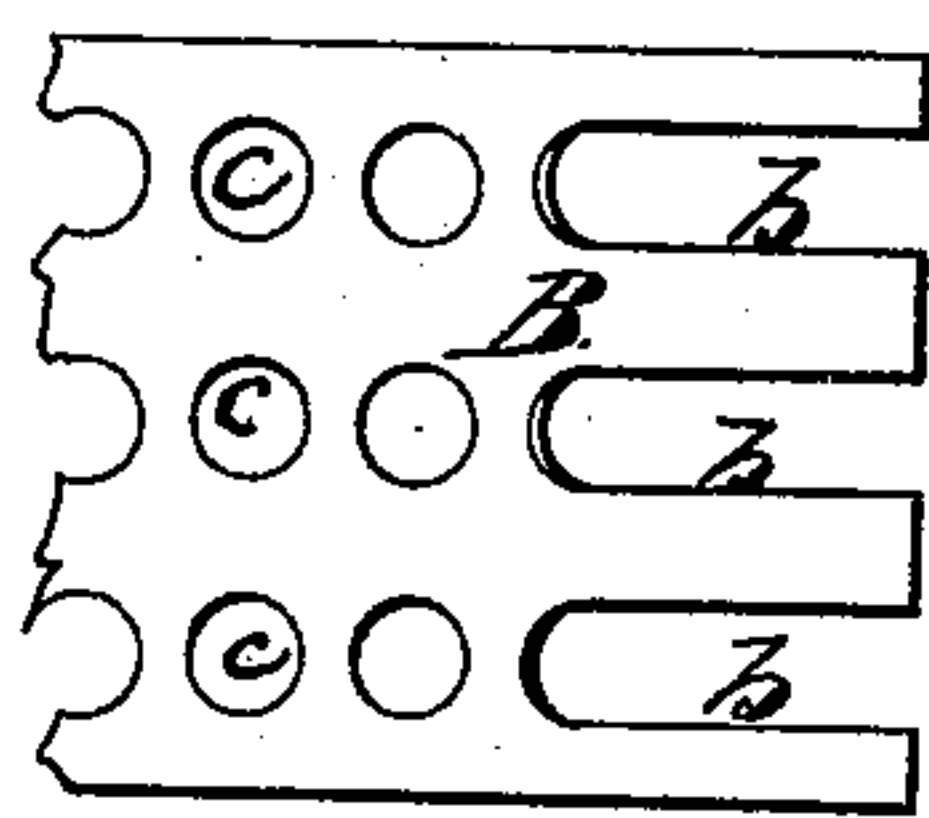
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Witnesses:*  
*John M. Mullen*  
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*Inventor:*  
*Richard Gilbert.*



# UNITED STATES PATENT OFFICE.

RICHARD GILBERT, OF ROCHESTER, NEW YORK.

## IMPROVEMENT IN ROTARY PUMPS.

Specification forming part of Letters Patent No. 42,083, dated March 29, 1864.

*To all whom it may concern:*

Be it known that I, RICHARD GILBERT, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Rotary Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation of the pump with one head of the shell A removed, showing the internal arrangement of the parts. Fig. 2 is a central transverse vertical section of the upper portion of Fig. 1, and having the same head removed. Fig. 3 is a plan of the upper or eduction wing, B, of the diaphragm D.

Similar letters of reference indicate corresponding parts in the several figures, and the arrow in Fig. 1 indicates the direction in which the inner cylinder revolves.

This invention consists in an improved construction of the diaphragm and its wings of the inner cylinder, and also of the double pistons of rotary pumps.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

The several letters A in the drawings represent the outer cylinder of the pump; B and B', the upper and lower wings of the diaphragm D; C, the inner or piston cylinder; H and H', the heads of said cylinder; P and P', the pistons or sliding valves; C', the crank; S, the hollow standard, which also constitutes the induction-pipe; T, the eduction or discharge pipe, and J the journals.

The cylinder A of the pump has each end inclosed by a head, F, which heads have an offset fitting properly over the heads H and H' of the piston-cylinder C. The openings *g* and *f* may be made exactly opposite each other, as shown in the drawings, or they can be made, as circumstances or convenience may require, at any point between their present relative position and the abutment *h*.

The cylinder C is arranged concentric with the cylinder A, and the diaphragm D measures at least one-fourth of the circumference of cylinder C, and is of like diameter. The distance from *e* to *e'* should also be at least one-fourth of the circle of cylinder A.

The wings B and B' reach from *n* and *n'* to the points *e* and *e'*, and the exact circle for the

wings may be ascertained in the following manner: Lay out the quarter-circles from *n* to *n'* and from *e* to *e'*, and also the piston P, of the desired thickness, the same length as P', but with each end equidistant from the center of cylinder C. Then strike the circle of B from *e* to *n*, so as to touch the left-hand corner of P. The radius of B' is exactly the same as that of B. Thus P and P' are provided a bearing at both ends throughout the entire circuit.

It is desirable to make the ends of the pistons to fit the circle of the outer cylinder, A, so as to give them as much bearing-surface as possible while performing their labor.

The wings B and B' have a series of orifices, *e*, (seen in Figs. 2 and 3,) which afford an opening at least equal to those of the induction and discharge *g* and *f*.

The end of the wing B, the inner face of which is shown in Fig. 3, has openings *b* cut through to the end for the purpose of relieving the pistons entirely from pressure or strain the instant they reach the point *e*, and while making their longitudinal changes.

It will be seen that while P' is traveling from *e* to *e'* it is performing the whole duty of suction and discharge, thus relieving P while passing from *e* to *n*, which at the same time makes the necessary change through the cylinder C, and its opposite end from *n'* to *e'*, when it in turn takes effect.

The diaphragm D and wings B and B' may be attached to the shell or cylinder A, by screws through the points indicated by the several letters *a*, Fig. 1, or they may be cast to the cylinder; or the inner diameter of the cylinder may be increased to the red circle, and the section between *e* and *e'* cast to B and B', in which latter case a brass or a composition pump might be applied to an iron shell.

The quarters of the cylinder C between the pistons may be cast to the head H', and secured to the head H by heavy screws *s*, Fig. 1. The journals J may be cast to the heads H and H', or made separate and tapped into them.

The pistons P and P' may be cast of brass or other metal; or they may be made of lignum-vitæ or other hard wood, and they are halved together, as seen in Fig. 2, each being cut away sufficiently to admit of the required lateral change of it across the other.

The great advantage in making them of

lignum-vitæ is that the sand and grit often taken up with the water will not "cut away" the working parts nearly so fast as when the pistons are made of metal.

The principal object of making the grooves in which the pistons operate the entire length of the cylinder, as shown in Fig. 2, is to allow the pistons—especially when made of wood—to be made strong enough in the center to prevent any fracture or vibration while in action.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The diaphragm D, wings B and B', and

shell or cylinder A, in combination with the double pistons P and P', and cylinder C, the parts being constructed and arranged substantially in the manner specified.

2. Making the cylinder C with one or both of its heads H and H' detachable, they being attached with their inner face flush with the outer edges of the pistons P and P'.

RICHARD GILBERT.

Witnesses:

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WM. S. LOUGHBOROUGH.